

# Women and Ischemia Syndrome Evaluation (WISE) Diagnosis and Pathophysiology of Ischemic Heart Disease Workshop

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## Session I

### 1. Topic and Author

#### **Magnetic resonance for detecting myocardial ischemia**

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### 2. Where we stand in 2002. Overview/rationale for inclusion of topic.

Magnetic resonance provides a means to detect myocardial ischemia through  $^{31}\text{P}$  spectroscopic studies. These studies are performed at rest and with hand grip stress using a surface coil placed over the precordium. This approach provides a unique means for detecting ischemia and identified 20% of women who underwent coronary angiography for chest pain evaluation as having a positive  $^{31}\text{P}$  response suggestive of ischemia.

### 3. Current challenges and the most important issues for future research

Current MR systems are not equipped to perform these studies and the usual magnetic field strength of 1.5 T is suboptimal. Higher field systems (3 T) have been FDA approved for body imaging and should provide even more information, including pH, not possible at 1.5T. Studies need to be performed at the higher field and function needs to be correlated with  $^{31}\text{P}$  results. Outcomes in patients with evidence of ischemia need to undergo more careful scrutiny.

### 4. Current challenges in the areas of communicating messages to health care community, patients and the public

Additional studies, published in the peer review journals, need to be performed. The challenge is to educate the health care community on this new technologic approach.

### 5. Translating new findings to improved diagnosis and treatment/saving lives.

The new  $^{31}\text{P}$  results need to be correlated with other more conventional parameters such as regional wall motion and myocardial perfusion images. Such correlations will provide better insight into the ability of these studies to enhance diagnosis of ischemia in chest pain syndromes in women.

### 6. References.

1. Buchthal SD, den Hollander JA, Bairey Merz CN, Rogers WJ, Pepine CJ, Reichek N, Sharaf BL, Reis S, Kelsey SF, and **Pohost, GM**. Abnormal Myocardial Phosphorus-31 Nuclear Magnetic Resonance Spectroscopy During Stress in Women with Chest Pain But No Significant Coronary Angiograms. *NEJM* 342(12):829-835, 2000.
2. Butterworth EJ, Evanochko WT, and **Pohost GM**. The  $^{31}\text{P}$  NMR Stress Test: An Approach for Detecting Myocardial Ischemia. *Annals of Biomed. Eng.* 28:1-4, 2000.